

1-2

## Skills Practice

## Properties of Real Numbers

Name the sets of numbers to which each number belongs.

1. 34  $\mathbb{R} \mathbb{Q} \mathbb{Z} \mathbb{W} \mathbb{N}$

2. -525  $\mathbb{R} \mathbb{Q} \mathbb{Z}$

3. 0.875  $\mathbb{R} \mathbb{Q}$

4.  $\frac{12}{3}$   $\mathbb{R} \mathbb{Q} \mathbb{Z} \mathbb{W} \mathbb{N}$

5.  $-\sqrt{9}$   $\mathbb{R} \mathbb{Q} \mathbb{Z}$

6.  $\sqrt{30}$   $\mathbb{R} \mathbb{I}$

Name the property illustrated by each equation.

7.  $3 \cdot x = x \cdot 3$

Commutative

8.  $3a + 0 = 3a$

Identity

9.  $2(r + w) = 2r + 2w$

Distributive

10.  $2r + (3r + 4r) = (2r + 3r) + 4r$

Assoc.

11.  $5y\left(\frac{1}{5y}\right) = 1$

Mult. Inv.

12.  $15x(1) = 15x$

Identity

13.  $0.6[25(0.5)] = [0.6(25)]0.5$

Assoc

14.  $(10b + 12b) + 7b = (12b + 10b) + 7b$

Commut.

Name the additive inverse and multiplicative inverse for each number.

15. 15  $-15; \frac{1}{15}$

16.  $1\frac{1}{4}$   $-1\frac{1}{4}; \frac{4}{5}$

17.  $-\frac{4}{5}$   $\frac{4}{5}; -\frac{5}{4}$

18.  $3\frac{3}{4}$   $-3\frac{3}{4}; \frac{4}{15}$

Name the property illustrated by each statement.

11. If  $a = 0.5b$ , and  $0.5b = 10$ , then  $a = 10$ .

transitive

12. If  $d + 1 = f$ , then  $d = f - 1$ .

Subtraction

13. If  $-7x = 14$ , then  $14 = -7x$ .

Symmetric

14. If  $(8 + 7)r = 30$ , then  $15r = 30$ .

Substitution

Name the property illustrated by each statement.

9. If  $t - 13 = 52$ , then  $52 = t - 13$ .

Symm.

10. If  $8(2q + 1) = 4$ , then  $2(2q + 1) = 1$ .

division

11. If  $h + 12 = 22$ , then  $h = 10$ .

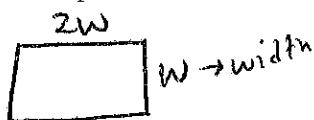
Subtr

12. If  $4m = -15$ , then  $-12m = 45$ .

mult

Define a variable, write an equation, and solve the problem.

25. **GEOMETRY** The length of a rectangle is twice the width. Find the width if the perimeter is 60 centimeters.



$$2(2w) + 2w = 60$$

$$6w = 60$$

$$w = 10 \text{ cm}$$

Solve each equation or formula for the specified variable.

16.  $a = 3b - c$ , for  $b$

$$\frac{a+c}{3} = b$$

18.  $h = 12g - 1$ , for  $g$

$$g = \frac{h+1}{12}$$

20.  $2xy = x + 7$ , for  $x$

20.  $2xy - x = 7$

$$x(2y-1) = 7$$

$$x = \frac{7}{2y-1}$$

22.  $3(2j - k) = 108$ , for  $j$

$$6j - 3k = 108$$

$$6j = 108 + 3k$$

$$j = \frac{36+k}{2}$$

24.  $\frac{m}{n} + 5m = 20$ , for  $m$

[24.]

Tough one!

$$m\left(\frac{1}{n} + 5\right) = 20$$

$$m = \frac{20}{\frac{1}{n} + 5}$$

$$m = \frac{20}{\frac{1+5n}{n}}$$

$$20 \cdot \frac{n}{1+5n}$$

$$m = \frac{20n}{1+5n}$$

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Solve each equation. Check your solutions.

1.  $|x + 15| = 37$   
 $\{-52, 22\}$

①  $x+15=37$  or  $x+15=-37$   
 $x=22 \checkmark$   $x=-52 \checkmark$

3.  $|x - 5| = 45$   
 $\{-40, 50\}$

③  $x-5=45$  or  $x-5=-45$   
 $x=50 \checkmark$   $x=-40 \checkmark$

5.  $|5b + 9| + 16 = 2$   
 $\emptyset$

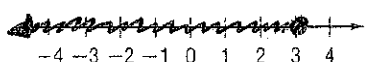
⑤  $|5b+9|=-14$

7.  $5n + 24 = |8 - 3n|$   
 $\{-2\}$

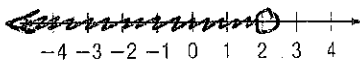
⑦  $5n+24=8-3n$  or  $-5n-24=8-3n$   
 $8n=-16$   $-2n=32$   
 $n=-2 \checkmark$   $n=-16$

Solve each inequality. Describe the solution set using set-builder or interval notation. Then graph the solution set on a number line.

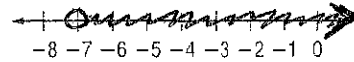
1.  $7(7a - 9) \leq 84$   
 $\{a | a \leq 3\} \quad (-\infty, 3]$



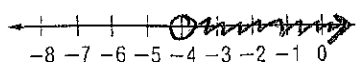
2.  $3(9z + 4) > 35z - 4$   
 $\{z | z < 2\} \quad (-\infty, 2)$



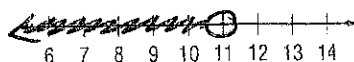
3.  $5(12 - 3n) < 165$   
 $\{n | n > -7\} \quad (-7, +\infty)$



4.  $18 - 4k < 2(k + 21)$   
 $\{k | k > -4\} \quad (-4, +\infty)$



5.  $4(b - 7) + 6 < 22$   
 $\{b | b < 11\} \quad (-\infty, 11)$



6.  $2 + 3(m + 5) \geq 4(m + 3)$   
 $\{m | m \leq 5\} \quad (-\infty, 5]$

